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## *ARGOS Global Downlink*

- HWCI 3.3.3.1 = ARGOS Transmitter
- HWCI 3.3.3.2 = ARGOS Antenna
- HWCI 3.3.7.1 = ARGOS/GPS Nav. Unit
- HWCI 3.3.7.2 = ARGOS/GPS Nav. Unit GPS Antenna
- HWCI 3.3.7.2 = ARGOS/GPS Nav. Unit ARGOS Antenna



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**3.3  
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November 4-5, 1998

## ***HWCI 3.3.3.1-3.3.3.2*** ***ARGOS Transmitter & Antenna***

- Requirements Traceability
  - DTRD Section 3.3.1.3: Backup TM downlink
    - one or more backup global TM downlink system(s)
- Functional and Performance Requirements
  - 3.3.3.1.a - Transmitter shall transmit ULDB & Science housekeeping data on 8 IDs with 32bytes/ID.
  - 3.3.3.1.b - Transmitter must be certified with the ARGOS satellite system for TM downlink and operate at 401.65 MHz
  - 3.3.3.1.c - Transmitter shall not exceed peak power consumption of 2.45W during transmissions and 1W average power consumption over 60 seconds into a 50 Ohm load.
  - 3.3.3.1.d - Transmitter shall produce an RF output min. of 0.5W and a max. of 1.3W during transmissions.



**ULDB**  
**PDR**

**3.3**  
**Telemetry**

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## *HWCI 3.3.3.1 - 3.3.3.2*

### *ARGOS Transmitter & Antenna*

- Functional and Performance Requirements Cont'd
  - 3.3.3.1.e - A “transmit error count” mode shall occupy 4 bytes and be host controlled
    - Enables users to count total errors (0-255), 1 byte
    - Keeps track of the most recent errors and their codes, 2 bytes
    - Embeds transmit error count mode data within data stream, 1 byte
  - 3.3.3.1.f - A “Failsafe” mode shall be host controlled
    - Enabled upon power up, 60 sec. Repetition rate
    - Unique ID code with no message length, 1 byte
    - On Duty Cycle = 24 hrs., Off Duty Cycle = 0 hrs.
  - 3.3.3.1.g - Operating Temperature Range = -40C to +70C
  - 3.3.3.2.a - Antenna shall be a 1/2 wave base loaded UHF Omni Whip



**ULDB**  
**PDR**

**3.3**  
**Telemetry**

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## ***HWCI 3.3.3.1 - 3.3.3.2*** ***ARGOS Transmitter & Antenna***

- Transmitter Description
  - 9.225”L x 2.75”W x 1.09”H
  - Weight < 200g
  - Power Input = 7VDC - 14VDC via DB25 connector
  - RF Output: BNC female
  - Interface: RS232 = 2400 baud, No parity, 8 data bits, and 1 start and stop bit
- Antenna Description
  - 12” long Flexible Omni Whip
  - 1/2 Wave, BNC base loaded, UHF antenna



**ULDB**  
**PDR**

**3.3**  
**Telemetry**

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## ***HWCI 3.3.3.1 - 3.3.3.2*** ***ARGOS Transmitter & Antenna***

- Risk Assessment & Mitigation/Reliability
  - ST-5 Flight History
    - 15 successful LDB flights
    - 12 successful Pathfinder flights
  - COTS
  - ST-13s certified PTT via ARGOS network



**ULDB  
PDR**

**3.3  
Telemetry**

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November 4-5, 1998

## ***HWCI 3.3.7.1 - 3.3.7.3 ARGOS/GPS & Antennas***

- Requirements Traceability
  - DTRD Section 3.3.1.3: Backup TM Downlink
    - one or more backup global TM downlink systems
  - DTRD Section 3.1.4: Backup Power
    - redundant power system to provide power for 7 days min. for one 3D Positioning device and one global downlink transmission device
- Functional and Performance Requirements
  - Unit shall be an ARGOS Certified PTT operating at 401.65 MHz
  - Transceiver shall not exceed peak power consumption of 6.65W during transmissions and 1.53W average over 40 seconds
  - Minimum output power shall be +30dbm (1W),  $\pm 1\text{db}$  with ALC



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**3.3  
Telemetry**

## ***HWCI 3.3.7.1 - 3.3.7.3 ARGOS/GPS & Antenna***

- Functional and Performance Requirements Cont'd
  - Operating Temperature range shall be -40C to +60C
  - GPS RCVR shall update every 2 Hz.
  - GPS position accuracy shall be 25m, velocity accuracy shall be 0.1 m/sec, and time accuracy = 1 micro-second
  - GPS shall operate from sea level to 130,000 ft.
  - GPS Dynamic performance shall be 500 m/sec velocity (max), acceleration = 4g (max) & Jerk = 20m/sec
  - GPS acquisition from a cold start shall be 2 to 5 minutes, warm start shall be 50 seconds.
  - GPS reacquisition < 2seconds
  - DGPS accuracy: Position = 2 to 5m, Velocity = 0.1m/sec



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Telemetry**

## ***HWCI 3.3.7.1 - 3.3.7.3 ARGOS/GPS & Antenna***

- Functional and Performance Requirements Cont'd
  - GPS antenna shall have 25db gain through the LNA
  - GPS antenna power consumption shall be 5V at 25mA (0.125W)
  - GPS antenna shall have short circuit protection and feedline fault detection



**ULDB  
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**3.3  
Telemetry**

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Code 584  
November 4-5, 1998

## ***HWCI 3.3.7.1 - 3.3.7.3*** ***ARGOS GPS & Antenna***

- ARGOS/GPS Transciever Description
  - 4.91”L x 2.27”W x 1.29”H
  - Weight = 116g
  - GPS antenna connector = SMA
  - ARGOS Antenna connector = SMA
  - Power Input = 7-11VDC
  - No host control interface required
- ARGOS Antenna Description
  - 12” long Flexible Omni Whip
  - 1/2 Wave, BNC base loaded, UHF antenna
- GPS Antenna Description
  - Micro-patch Antenna with magnetic mount
  - 1.6”W x 1.9”L x 0.55”H

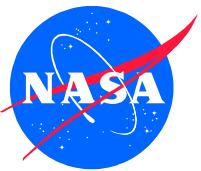


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PDR**

**3.3  
Telemetry**

## ***HWCI 3.3.7.1 - 3.3.7.3 ARGOS GPS & Antenna***

- Risk Assessment and Mitigation/Reliability
  - COTS
  - 2nd Generation unit
    - production to start Jan. 1999
    - NDBC order 100 units for Ocean Buoy Tracking
  - 1st Generation unit
    - 150 units in use for wildlife tracking
    - NACLS uses 100 units in Hazardous Waste Tracking on Rail-Cars
    - University of Wyoming Antarctic Balloon Mission
  - Telonics certifies PTTs via the ARGOS satellite network



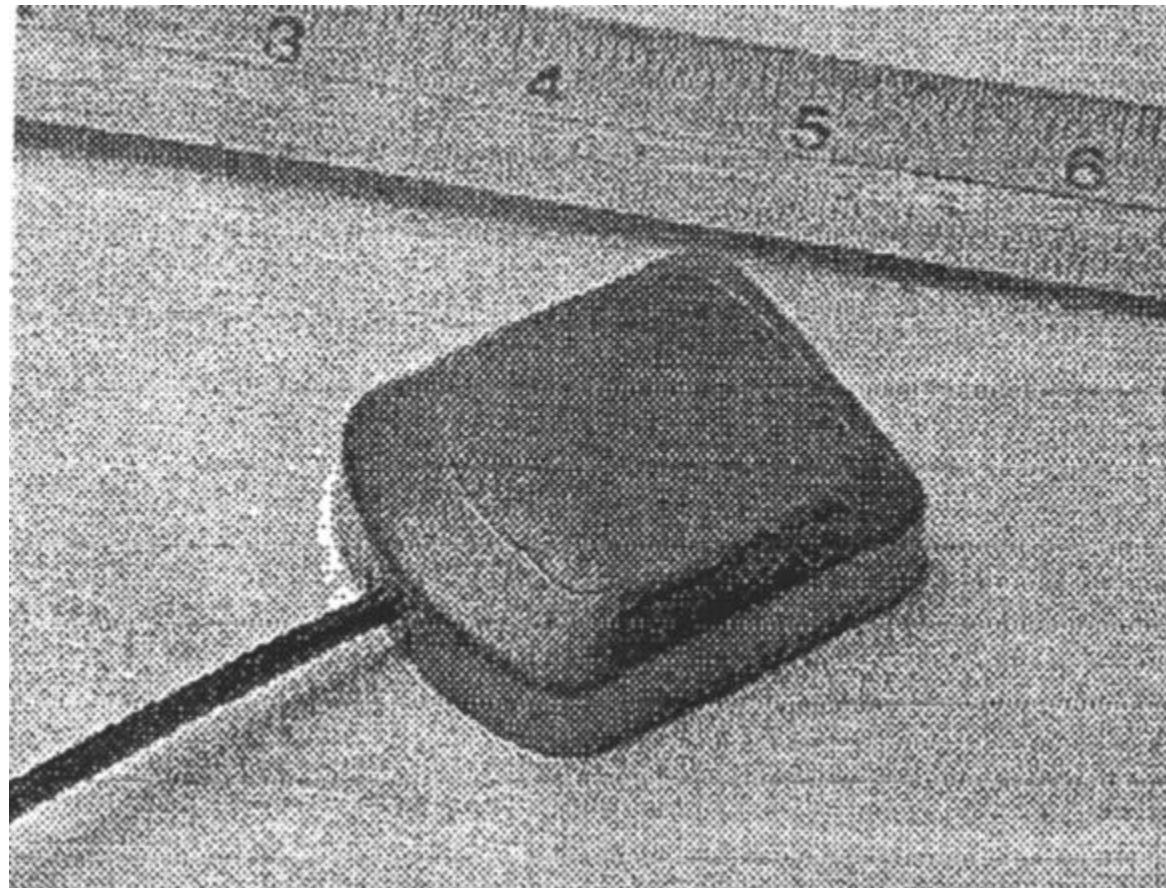
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**3.3  
Telemetry**

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Code 584  
November 4-5, 1998

## ***HWCI 3.3.7.1 - 3.3.7.3 ARGOS GPS & Antenna***

Telonics ST-14 GPS Antenna





ULDB  
PDR

3.3  
Telemetry

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November 4-5, 1998

## HWCI 3.3.7.1 - 3.3.7.3 *ARGOS GPS & Antenna*

Telonics ST-14

